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## EXCISION OF THE ELBOW-JOINT, SHOWING RESULTS. FROM A SERIES OF TWENTY-ONE CASES OPERATED ON AT THE MASSACHUSETTS GENERAL HOSPITAL.

BY H. H. A. BEACH, M. D.,

*Surgeon to Out-Patients.*

THIS collection of cases, comprising all, fatal as well as successful, which have occurred in the hospital service of Dr. R. M. Hodges, during a period of ten years, is reported for the purpose of showing the ultimate and excellent results of excision of the elbow when recovery takes place, and the advantages of a single straight incision in its performance. This method, largely avoiding the cross-cutting of any tissues, allows "the connection of the triceps-extensor tendon, with the investing aponeurosis of the arm and fore-arm, to be preserved almost intact. An attachment for the muscle is thus retained which diminishes, to a certain extent, the loss of power following its unavoidable separation from the olecranon."<sup>1</sup> Transverse incision of the integuments, even though the above mentioned connection is maintained, is in itself prejudicial to the subsequent motions of the limb, if the wound does not unite by first intention, but cicatrizes by granulation, as it almost invariably does.

Another cardinal point in this operation is the preservation of the attachment of the brachialis anticus muscle. It is commonly stated that this muscle is inserted into the coronoid process. No method of demonstration better displays the absolute fact in regard to this anatomical point than excision of the elbow on the dead subject, which, without dissection, makes plain that the attachment is into the shaft of the ulna and *base* of the coronoid process, abundant room being left between the process and the tendon for the passage of the saw (which should always be started on this side of the bone), and the removal of this portion of the ulna. Experience shows that the extent of fracture permitting an attempt to save the limb by excision seldom reaches a degree which prevents the carrying out of these rules; and it rarely happens that so much of the radius requires removal as to cause any interference with the insertion of

<sup>1</sup> Report of a Committee of the Associate Medical Members of the Sanitary Commission on the Subject of Excision of Joints for Traumatic Cause, 1863, page 11.

the biceps. The great muscles of extension and flexion are thus left in a comparatively undisturbed condition. The amount of bone excised decides to some extent the subsequent mobility. Excision of the articulating surfaces alone would probably in most cases be followed by an ankylosis. Regret might sometimes be felt at not having excised enough, but seldom at having removed too much. The sacrifice should always be at the expense of the humerus, since the limit for the ulna and radius is fixed, as has been stated, by the necessity of preserving the brachialis anticus and biceps muscles. This method of operation, as Dr. Hodges informs me, was taught twenty-six years ago by Alphonse Guérin in his private courses of instruction at Clamart. The *Éléments de Chirurgie* is, however, singularly deficient in details as regards excision of the elbow. A straight incision was proposed and practiced by Parck, on the dead subject, in 1782, and is that followed in what is known as Langenbeck's operation. A claim of "originality" for the procedure by which "the aponeurotic structures passing from the arm to the fore-arm" are preserved has been made by Mr. Maunder, of London, so recently as 1873. The earliest operation of the accompanying series was in 1866. The details above alluded to were observed then and in all subsequent cases, except when modified by existing wounds. In all its steps, the method has been taught in the operative courses of the Harvard Medical School since 1855. If the operation thus performed still possesses novelty it will not detract from the usefulness of this report.<sup>1</sup> The cases which follow are arranged in three groups, namely, excisions for injury, for disease, and for deformity. All of them were "complete excisions."

#### EXCISIONS FOR INJURY.

CASE I. *Compound Fracture ; Wound torn open Eleven Weeks after Operation ; Recovery with a Useful Arm.* — A man aged twenty-nine. Compound comminuted fracture of humerus and radius into the elbow-joint. Wounds communicating with the fracture over internal and external condyles. Excision a few hours after the accident. Two inches of humerus removed. Discharged at end of five weeks. Eleven weeks after the operation he could take his hat off with the injured arm. At this period he wrenched it and tore open the cicatrix. Three days later he fell and struck the joint, and was readmitted to the hospital, with a transverse wound, disclosing the ends of the bone, covered with granulations. It required six weeks for his recovery, and at the end of

<sup>1</sup> Dr. H. J. Bigelow's plan for excising the elbow-joint has been suggested since these cases were operated on. The incision is similar to that described, but in removing the articular surfaces he preserves the internal and external condyles of the humerus. This secures additional chances of good pronation, supination, flexion, and extension, by saving the attachments of muscles having their origin at the condyles. Proceedings of the Boston Society for Medical Improvement ; Boston Medical and Surgical Journal, March 30, 1876.

twenty-two weeks from the occurrence of the injury he was again discharged.

*Condition Nine Years after the Excision.* — "Can knock a man down with a blow from the arm operated on. Can carry three full lager-beer glasses at once in the hand. Do a certain amount of teaming for a living. Can load and unload carts of furniture, coal, and wood."<sup>1</sup>

*CASE II. Compound Fracture; Excision through Existing Wound; Recovery with a Useful Arm.* — A man aged twenty-four. Compound fracture of humerus and radius into the elbow-joint by being violently thrown against a revolving machine. Ragged wound on the outer and posterior aspect of the joint, through which lacerated muscles protrude. Excision, one hour after the accident, through the existing wound. A month after the operation an attack of hospital gangrene (prevalent at that period). Discharged two months from the time of injury.

*Condition Ten Years after the Excision.* — Can easily touch the forehead and shoulder of the same side with the hand of the injured arm. Can put on his collar, button it behind, write, and lift as much and as well as with the arm of the other side. Can easily earn fifteen hundred dollars a year by mechanical work which requires the use of both arms. Has for several years run a stationary engine and made his own repairs. Has good sensation throughout the limb, and perfect motion of wrist and finger joints. (See heliotypes.)

*CASE III. Joint opened by a Saw; Excision through the Wound; Recovery with a Useful Arm.* — A man aged twenty-three. Arm caught by a "band saw," which entered behind the elbow, cutting off the ulna at the base of the olecranon, the outer condyle of the humerus, and cutting into the head of the radius. The muscles were cleanly incised, and a large wound was inflicted. Neither the brachial artery nor the ulnar nerve were injured. One hour after the accident the ends of the bone were squared and removed, without the necessity of any additional incision. Discharged four weeks from the time of injury.

*Condition Six Years after the Excision.* — "Can carry a pailful of water over half a mile with the hand of that side. Can raise my hand above my head with ease, and take down clothes or anything else that is hanging. Can use the ax to chop wood, and the fork to pitch hay. Have worked hard with it for about two years."

In connection with this case mention should be made of a similar accident reported in this journal, August 14, 1862, by Dr. Edward Barton, of Orange. A "tub-saw," of twenty-two inches diameter, came in contact with the flexed elbow of a man aged sixty-one, passing through "the soft tissues and diagonally through the humerus, at the

<sup>1</sup> These quotation marks here, and where they occur subsequently in describing a patient's condition, indicate that the statement is his own, communicated in writing. Other statements in relation to condition are from personal examination.

point where the bone spreads out to form the condyles, and in a similar manner through the neck of the radius and ulna, just below the coronoïd process, the entire joint dropping upon the floor." The final recovery of this patient was such that he resumed his occupation of a chair-maker, "working from morning till night," and it is stated that "at some branches of his business he can accomplish as much as ever he could."

**CASE IV. *Compound Fracture ; Excision Five Weeks after ; Recovery with a Useful Arm.*** — A man aged twenty-three. Compound fracture of humerus and radius into the elbow-joint, the arm having been caught between the bunters of two rail-road cars, six days before admission to the hospital. The limb was much swollen from the wrist to the shoulder. Profuse suppuration followed, and sloughing of the skin. Excision by a single straight incision five weeks after the accident. Discharged at the end of thirteen weeks.

**Condition Five Years after the Excision.** — Is now employed as freight brakeman on a railroad, and works from seven A. M. until six P. M., using the arm constantly. He has perfect sensation in the limb, and the movements of flexion and extension, pronation and supination are complete and satisfactory. He can put his hand over his head unaided ; also around behind him so as to touch the middle of his back with either the palmar or dorsal surface.

**CASE V. *Compound Comminuted Fracture ; Excision One Week afterwards, through an Existing Wound ; Recovery with a Useful Arm.*** — A man aged twenty-three. Compound comminuted fracture of the humerus, radius, and ulna, opening the joint, from being pushed off a rapidly moving horse-car. A week after the injury excision was performed through the existing wound. Discharged at the end of three months.

**Condition Five Years after the Excision.** — Has good flexion, pronation, and supination, but not complete extension, though sufficient to permit his carrying a pail of water comfortably for quite a distance. Uses garden tools readily, and dresses himself without difficulty. There is shortening of the arm to the extent of three and a half inches.

**CASE VI. *Compound Fracture and Separation of Epiphysis ; Excision through the Existing Wound ; Recovery with a Useful Arm.*** — A boy aged eight was run over by a horse-car, receiving a compound fracture of the right elbow-joint, separating the epiphysis of the humerus, which together with the heads of the radius and ulna were broken into several fragments. The integuments were stripped from the arm high up into the axilla. There was also a serious scalp wound, and the right ear was nearly torn off. Excision through the existing wound three hours after the injury.

**Condition Two Years after the Excision.** — Can use the limb for all



purposes, and joins in all games and athletic sports of boys of his age. The arm equals the other in strength, no movement being impaired except supination. It is three inches shorter than the left, growth in length not having kept pace with that of its fellow. Does not appear conscious of any difference in the two arms.

**CASE VII. Compound Fracture ; Excision Twenty-four Hours after ; Recovery with a Useful Arm.** — A man aged forty-eight. Compound fracture of the olecranon and external condyle, opening the left elbow-joint, from the kick of a horse, the corks of his shoe cutting the integument over the olecranon. Excision by a single straight incision twenty-four hours after the accident. Discharged at the end of four weeks.

*Condition Three Years after the Excision.* — Can carry a pail of water any distance, or lift a hundred pounds. Does all regular farm work. Hoes, shovels, mows, rakes, and “can use the fingers and hand as well as ever he could.” Feels that the arm is still gaining strength.

**CASE VIII. Compound Comminuted Fracture ; Excision Twenty-Four Hours after ; Recovery with Anchylosis.** — A man aged fifty-eight. A heavy stone fell upon his right arm, producing compound comminuted fracture of the humerus and radius into the elbow-joint, with a contused and lacerated wound over the external condyle and the upper third of the fore-arm, involving the muscles beneath. On the following day the joint was excised through a single straight incision, three inches of the radius being removed in a much comminuted condition. Discharged at the expiration of eleven weeks.

*Condition Two Years after the Excision.* — Anchylosis at an angle of one hundred and thirty-five degrees, with no pronation or supination. Has good use of his wrist and fingers, and is able to earn his living as a teamster ; “ would not take five hundred dollars for the limb,” nor would he risk another operation through fear that it might not leave him so useful an arm as he already has. By his own confession he neglected to exercise the arm after leaving the hospital.

This patient is the oldest of those whose cases are reported. Statistics show that anchylosis has no connection with advanced years, but depends on other causes. In the present instance it was undoubtedly due to the injury inflicted on the muscles at the time of the accident, which was followed by long-continued suppuration, and to the fact that so much of the radius was removed.

**CASE IX. Compound Fracture ; Excision the Same Day ; Recovery with a Useful Arm.** — A man aged thirty-eight, while intoxicated, was thrown out, backwards, over the tail-board of a wagon, falling on frozen ground, causing a compound fracture of the internal condyle of the humerus into the elbow-joint. Excision was performed the same day through a single straight incision. A lacerated wound on the anterior

aspect of the joint, not communicating with the fracture, was closed by sutures. Discharged three months and a half after the accident.

*Condition Nine Months after the Excision.* — Is at work at his trade of a house-painter. This compels him to stand on ladders twenty and twenty-five feet from the ground. He holds on to the ladder with the injured arm, and reaching to one side does the required painting. Motions of the fingers and wrist are perfect. Has excellent flexion, extension, pronation, and supination. Says the arm is nearly as useful as ever it was, and that it is gaining strength every day.

Five cases are briefly narrated which resulted fatally; they are appended to complete the record of excisions for injury.

*CASE X. Compound Fracture and Dislocation; Fracture of the Thigh; Excision One Hour afterwards; Death from Shock at End of Eighteen Hours.* — A man aged forty. Compound fracture of ulna and radius, and dislocation of the elbow-joint from a fall of forty feet. Also simple fracture of the femur. Severe shock. Excision by a single straight incision one hour after the injury.

During the following night great distress in the abdomen. Gradually sank, and died towards morning. No autopsy could be obtained.

*CASE XI. Compound Comminuted Fracture; Excision; Death from Tetanus in Thirteen Days.* — A man aged twenty. Compound comminuted fracture of humerus and ulna into the elbow-joint, received in shackling cars. Soft parts extensively lacerated, and ulnar nerve exposed in the wound. Joint excised through a single straight incision a few hours after the accident. Eight days after operation, trismus followed by tetanus. Death thirteen days from time of injury.

*CASE XII. Compound Fracture; Excision Seventeen Days after; Death at End of Twenty-Four Days from Thrombus and Gangrene of the Lungs.* — A man aged forty-eight. Walking on a railroad track was struck by a locomotive, receiving a compound fracture of the olecranon, opening the elbow-joint. Seventeen days afterward excision, performed through a single straight incision. A series of chills supervened, and he died twenty-four days after the accident, and seven days after the operation.

At the autopsy a thrombus was found in the pulmonary artery, and the right lung was in a gangrenous condition.

*CASE XIII. Compound Comminuted Fracture; Fracture of the Ilium; Excision Five Hours afterwards; Death at End of Six Days.* — A man aged fifty-five. Five hours before admission fell through the hatch-way of a coal-vessel. Compound comminuted fracture of the ulna into the elbow-joint, with laceration of the soft parts. Also, fracture of the crest of the ilium. Elbow-joint excised through a single straight incision. The patient did well at first, though he complained greatly of

pain. On the third day diarrhoea set in, and the arm became very much swollen. There was great ecchymosis about the ilium. His pulse grew weak, and he gradually sank, and died six days after the injury. No autopsy was permitted.

CASE XIV. *Compound Fracture; Other Serious Injuries; Excision two Hours after; Death from Shock at End of Eighteen Hours.*—A lad aged nineteen. Caught in the machinery of a flour-mill, he received a compound fracture of the right humerus, radius, and ulna into the elbow-joint; also a compound fracture of the os calcis. From a lacerated wound of the left axilla the belly of the biceps muscle protruded. The skin of the abdomen was torn up from the pelvis to the ribs, and hung loose. There was also fracture of the pelvis and a wound of the left thigh. Excision was performed two hours after the accident. The shock of the injury was not recovered from, and the patient died in eighteen hours.

Of these fourteen cases of excision for injury it will be seen that five terminated fatally; in two (Cases X. and XIV.) hardly any other result could have been anticipated. In Case XIV. the propriety of operation was discussed, and, but for the youth of the subject, would not have been decided upon affirmatively.<sup>1</sup>

Tetanus (Case XI.) and septicæmia (Cases XII. and XIII.), which together occasioned three deaths, at the end of twenty-four, six, and eight days respectively, were as much, and even more, results of injury than of operation. In Case XII. excision was deferred, possibly to a too remote period from the time of accident. In none of the cases ending fatally, however, was there any reason to think that amputation, or expectant treatment, would have been followed by more favorable results. If traumatic excisions, in civil practice, were comparable with those performed for gun-shot injuries, the opinion of Dr. Otis, expressed in the *Surgical History of the War of the Rebellion*, would perhaps not support this consoling conclusion. He says, "although the point is open to argument, I fear the substitution of this resection for amputation effected no saving of life."

#### EXCISIONS FOR DISEASE.

CASE XV. *Articular Caries; Excision; Recovery with a Useful Arm.*—A man aged forty-two. For a year, pain in the elbow, obliging him to give up work. Joint enlarged and inflamed, with a number of fistulous openings, discharging pus copiously. No history of injury or

<sup>1</sup> That excessive injury does not absolutely forbid operation is shown by a case now under my care, in which I excised the elbow of a man aged twenty-seven, and two weeks afterwards laid open the knee-joint by extensive incisions, almost detaching the leg, on account of suppuration set up within the articular capsule, from a wound over the head of the tibia received at the same time as that of the elbow. At the end of sixty-one days he is doing perfectly well.

other assignable cause. Excision by a single straight incision. Articular surfaces of humerus, radius, and ulna found in a carious condition. Discharged at the end of six weeks.

*Condition Six Years after the Excision.* — Since leaving the hospital has worked in a cemetery, digging graves, wheeling a barrow, etc., and now uses the arm for every purpose as well as the other. On examination it is found that though he cannot completely extend it there is excellent flexion, pronation, and supination. Two years ago had trouble in his knee, with suppuration, ending in a complete ankylosis.

**CASE XVI.** *Disorganized Joint; Excision; Recovery with a Useful Arm.* — A colored man aged twenty-three, struck his elbow violently against a cart-wheel. Six weeks afterwards the joint was hopelessly diseased with fistulous openings. Excised through a single straight incision. Discharged at the end of six weeks.

*Condition Five Years after the Excision.* — Can use the arm for everything that he could before the operation, except carrying a "hod;" can use a pickaxe or shovel as well as he ever did. Pitches hay and shovels coal. "Mowed all summer, eighteen hours a day." "Is not left-handed, but can lift more with the injured arm (the left one) than he can with the right." At present "works ten hours a day as a gardener."

**CASE XVII.** *Chronic Disease of Joint; Excision; Recovery with a Useful Arm.* — A colored woman aged sixty-one years. For three years, disease of the elbow-joint. Several fistulous and suppurating openings; motions limited. Excision through a single straight incision. Discharged three months after operation.

*Condition One Year after Excision.* — Has excellent flexion, extension, pronation, and supination. Can knit, sew, darn stockings, or lift a chair with perfect ease. Has good use of the wrist and fingers, as implied by the above statement. Is still gaining strength in the limb.

**CASE XVIII.** *Chronic Inflammation of Joint; Excision; Recovery.* — A man aged twenty-four. Nine weeks ago his elbow, which had previously troubled him, became painful and swollen. The arm is now extended and nearly motionless, with three fistulous openings into the joint. Excision was performed through a single straight incision. Repeated attacks of mild erysipelas delayed his discharge until three months after the operation.

*Condition Eight Months after the Excision.* — He writes that "the arm is gaining strength every day," but does not specify in his letter how much or what he is able to do with it.

#### EXCISIONS FOR DEFORMITY.

**CASE XIX.** *Ankylosis; Excision; Recovery with a Useful Arm.* — A man aged twenty-nine. Complete bony ankylosis between the ulna and humerus from an injury, three years before admission. Radius

rotates freely, but there is a large mass of ossific deposit about the lower end of the humerus and the olecranon. Excision performed through a single straight incision six inches long, removing with difficulty a shapeless mass of bone, very thick, and two inches in length. The operation was a bloody one, and a large number of ligatures were required. At the expiration of three months a renewed deposit of bone formed, and, in spite of passive motion under ether, ankylosis again occurred. A second excision was performed, three inches of bone being removed. The radius was found firmly united to the humerus by strong ligamentous bands. The ulna was lengthened upwards and beyond the junction of the radius and humerus. Discharged five weeks after the second operation.

The difficulties attending excision for ankylosis are remarked upon by Dr. Hodges in his *Excision of Joints*, and it is stated that, "if the bones are not removed so freely as to leave a considerable interval between them, the tendency to reunion will be with difficulty overcome." The operator considers that inattention to this maxim occasioned the necessity of a second excision.

*Condition Five Years after the Excision.*—No better statement of the ultimate result of this case can be given than the following letter from the patient himself.

March 12, 1876.

SIR, — Yours of the 11th inst. received by me to day, and in reply to the first inquiry, Is it my right or left hand? It was the right. And if it was the right, if I could write? Yes, as well as ever. Second, How much can I lift. Never tested as to lifting, but in wheeling a bar row, say five or six hundred pounds, can do it without any injury; or in shoveling, don't hurt me in any way; also in carrying parcels, one is just as useful as the other. What I can take in one hand, shift it to the other, and it is just the same. Next inquiry is, If I could put the injured hand to the top of my head. Yes, readily. Also, if I can straighten the arm. Yes, completely. Next inquiry is, can I touch the shoulder of the injured side. Yes, as readily as I could before being injured. Next is, can I rotate the hand. Yes, can whirl it or twist it as fast as the other. Then you say, please state what assistance the arm is to me in any ordinary occupation. It is as useful to me as ever it was previous to my being hurt, and if I could afford it I would go in person and let you see that what I have written above is correct. I can shave myself with the right hand just the same as before being injured; in fact, can do everything under hand just the same. I remain, most respectfully,

W. R.

*CASE XX. Cicatrix from a Burn; Ankylosis; Death from Hæmorrhage.*—A female aged fourteen. Some years before admission, her arm, axilla, and side were severely burned. An ulcerated and granulating surface persists in the vicinity of the elbow-joint. Muscles of the arm and fore-arm atrophied, and motions of the elbow arrested by cicatricial tissue which extends around the joint and for some distance above and below it. Fore-arm flexed upon the arm at an acute angle. Hand partially flexed and supinated. Excision by a single straight incision. Ten ligatures applied, the wound, as might be expected, being very vascular. Two days afterwards severe secondary

hæmorrhage occurred, which required five bleeding points to be tied. She gradually failed, and died four days from the time of operation.

In explanation of this result, it should be said that this patient was an exceedingly feeble girl, and, as an autopsy showed, the subject of tuberculous lungs. The hæmorrhage took place in the night, unknown to herself, and was overlooked by her attendants, until no other termination than that which followed could be expected.

**CASE XXI. *Anchylosis from Unreduced Dislocation; Excision; Recovery with a Useful Arm.***—A man aged twenty-seven. One year ago dislocated both bones of the forearm backwards. An unsuccessful attempt at reduction, twenty days after the accident, resulted in making the injury compound, the wound being on the anterior surface of the joint. Several openings communicating with the joint continue to discharge, and bits of bone have exfoliated. The arm is extended and anchylosed, with the hand pronated. The integuments are tightly stretched over the back of the elbow joint. Excision was performed through a single straight incision, and the removal of the articulation, anchylosed by ligamentous union, was effected with difficulty. Two inches of bone were excised. Sharp secondary hæmorrhage occurred five hours after the operation, and again on the following morning. These hæmorrhages were repeated at intervals, during the succeeding month, and after the wound had filled with granulations. They were apparently due to the impaired health of the patient. They never required ligature of any vessel, but always stopped by compression. They debilitated and demoralized the man to such an extent, that he eloped from the hospital seven weeks after the operation.

***Condition Eight Months after the Excision.***—From neglect to use the arm considerable stiffness has resulted. Two months ago he was etherized, and the false joint easily carried through the full motions of extension and flexion, but not of pronation and supination. At present carries the arm at a right angle, and can slowly flex and extend it through a quarter of a circle, neither complete flexion or extension being attained. The muscles of the upper arm are recovering from their extremely atrophied condition, and the motions of the wrist and fingers are perfect.

The treatment pursued in these excisions can be briefly stated. The wound was invariably closed with sutures. The arm, after the operation, was laid upon a pillow, flexed at an angle of  $135^{\circ}$ , that being the position most comfortable for the patient. Local inflammation, abscesses, pain, etc., were met by active measures based on general surgical principles. A generous diet was always allowed and encouraged. When the arm was in a state to permit of bandaging, an internal angular splint of tin, broader than usually adopted for fractures,



and fitted as regards length to each individual case, was applied, and the patient allowed to get up and walk about, the wound being dressed without the removal of the splint. The time spent in the hospital was not great; one patient remained seventeen weeks, the others an average of about nine weeks. When discharged the splint was usually dispensed with, and a sling substituted. Passive motion was rarely practiced beyond that which came from such use of the limb as patients could be persuaded to make, and a useful arm was seldom obtained before the end of a year from the time of excision.

In twenty-one cases where amputation must otherwise have been performed, this report exhibits fifteen arms preserved, several of them being useful to a remarkable degree, and all of them, except one, retaining motion of the elbow, fore-arm, hand, and fingers. These excellent results suggest the inquiry whether this operation is not deserving of a broader application. A successful excision always leaves an arm more serviceable than one in which ankylosis has taken place after a bad fracture unaccompanied by a wound. Professor Busch, of Bonn, has twice excised with success the entire joint, for irreducible dislocation of the head of the radius, both pronation and supination being regained. A measure which of itself, in civil practice, so seldom occasions a fatal result, would seem more than merely justifiable in this seemingly trivial but thoroughly disabling accident, in which reduction is often impossible, or, if possible, so rare to maintain.

Excision of the elbow was first performed in the United States, in 1834, at the Massachusetts General Hospital, by the late Dr. John C. Warren, and although now very generally practiced in certain classes of injury and disease, it may still be doubted whether, in this brief period of forty years, the full range of usefulness has been reached which belongs to this invaluable operation.

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## RECENT PROGRESS IN MEDICAL CHEMISTRY.

BY E. S. WOOD, M. D.

*Fermentation of Urine.* — The method of preparing delicate test paper for the detection of urea in the urine or other fluid has been previously referred to in these reports.<sup>1</sup> M. Musculus has continued his researches upon this subject, and now recommends<sup>2</sup> the ropy alkaline urine of a patient with cystitis as the best material from which to obtain the ferment which causes the decomposition of urea to ammonia and carbonic acid. Such a specimen of urine should be precipitated with strong alcohol and filtered. The alcohol precipitates the mucus, etc., and renders the separation of the solid from the fluid by filtration very easy. The precip-

<sup>1</sup> The JOURNAL, July 2, 1874.

<sup>2</sup> Archiv der Physiologie, xii. 214.

itate is dried by gentle heat, powdered, and preserved in a well-stoppered bottle. The filter papers used may be prepared as test papers for urea in the manner mentioned in the previous report.<sup>1</sup>

If a little of the powder thus obtained be added to fresh urine or to a dilute solution of urea, and the whole kept in a warm place, the urea becomes rapidly and completely decomposed. Microscopic examination of this powder shows no spores, such as are always found in fermented urine, and to which has been ascribed the property of causing the decomposition of urea. The author, therefore, considers that this substance is a chemical or unformed ferment, and for the reason also that it is soluble in water, the perfectly clear solution acting as readily upon urea as the solid powder.

This ferment behaves with reagents almost precisely like mucin; it is precipitated by alcohol and acetic acid; Millon's reagent produces a precipitate which becomes rose-red on warming; the alcoholic precipitate dissolves in water, very readily, if the water contains a little salt, and the solution decomposes urea; 0.1 gramme dissolved in fifty cubic centimetres of water will completely decompose 0.2 gramme of urea to ammonia and carbonic acid in less than an hour, if kept at a temperature of about 35° C. The acetic acid precipitate will not act upon urea; in fact, almost all acids will destroy its activity, even though they are in very dilute solutions. If a small amount of the ferment be treated for ten minutes with a solution of hydrochloric acid (1:1000), and then neutralized with sodium hydrate, it will not act upon urea. Sulphuric, nitric, acetic, and salicylic acids prevent its activity as well as hydrochloric acid. A temperature of 80° C. destroys it also. Carbolic acid, which destroys the activity of all organized ferments, does not affect this one, so that the urea test paper soaked in pure carbolic acid and afterwards washed with alcohol loses none of its activity.

This ferment acts upon none of the other nitrogenous constituents of the urine, such as uric acid, kreatin, kreatinin, hippuric acid, etc., so that we have in it a reagent which may be used for the quantitative estimation of urea, and one which is not open to the objection that it also acts upon other substances which may exist in the urine in small amounts. The presence of albumen in the urine also does not affect its action on urea. The method recommended for performing the quantitative analysis for urea is as follows: To ten cubic centimetres of urine add a little sodic carbonate, dilute to ten times its volume with water, add a few drops of a solution of litmus, neutralize exactly with a dilute acid, and then add about 0.2 gramme of the powder. Keep at a temperature of from 35° to 40° C. In one hour the decomposition of the urea will be complete, when the ammonia derived from it may be estimated in the ordinary way by titrating with a standard solution of sulphuric acid.

<sup>1</sup> Loc. cit.

On account of the great similarity of this substance to other chemical ferments, such as diastase and the salivary and pancreatic ferments, in regard, for instance, to its solubility in water and its behavior with acids, alkalies, salts, and carbolic acid, the author considers that the material which causes the alkaline fermentation of urine is not an organized ferment, as has been thought by most authorities, but a chemical one, and that it is contained in the vesical mucus.

MM. Pasteur and Joubert<sup>1</sup> take exception to the above statements of Musculus, that it is the vesical mucus which acts as the true urea ferment, and that this ferment has none of the properties of the organized ferments for the reasons long known, that, whenever urea or urine becomes alkaline, there may always be detected a microscopic organism, and that normal urine when it does not contain the germs of this organism preserves its acidity for an indefinite period. They acknowledge, however, that there does exist a soluble ferment which is capable of decomposing urea into ammonia and carbonic acid at the ordinary temperature, and which does exist in decomposed urine. They attempt to reconcile the two facts by considering that the soluble ferment is produced by the organized one, and they find that the maximum amount of the soluble ferment is produced as soon as all of the urea, upon which the organisms live, is decomposed; they also find that this soluble ferment of Musculus may be produced by these living organisms in other fluids than urine, fluids which never were in contact with the vesical mucous membrane, and which never contained urea. By placing a little of the pure organized ferment in a decoction of beer yeast, for example, the organism grows and increases in number, and there is formed in the fluid a soluble ferment which may be precipitated by alcohol, the precipitate having all of the properties of that obtained by Musculus from the urine of cystitis, and having the power of decomposing urea to ammonia and carbonic acid.

The above statements of Pasteur and Joubert are confirmed by Berthelot,<sup>2</sup> who considers that the living organism is not the true ferment but engenders it, and that the soluble ferments once produced can then exert their specific action.

*Indican.* — The formation of indican, which is found in normal urine in small amount, and to a greatly increased extent in some pathological urines, from indol which is formed during the pancreatic digestion of albumen, has been previously mentioned.<sup>3</sup> Nencki<sup>4</sup> does not consider that the pancreatic fluid is at all necessary for the production of indol from albumen, since Hüfner found that, when albumen was treated with pure pancreatic ferment in such a manner as to entirely exclude all organ-

<sup>1</sup> Journal de Pharmacie et de Chimie, September, 1876, page 206.

<sup>2</sup> Ibid., page 208.

<sup>3</sup> The JOURNAL, July 1, 1875, page 14.

<sup>4</sup> Berichte der deutschen chemischen Gesellschaft, ix., No. 4, s. 299.

isms, no indol was formed, but on the other hand it was formed by merely allowing a solution of albumen to stand exposed to the air without the addition of any pancreatic or other animal tissue. He therefore considers that the indol is a specific product of the putrefaction of albumen by the formed ferments, and that the presence of indican in the urine during starvation, as was shown by Salkowski,<sup>1</sup> does not prove that it is formed within the system by the soluble ferments, since germs of the lower organisms exist not only in the pancreas but also in the liver, muscles, and other tissues.

That indol is one of the products of the fermentation and putrefaction of albumen there can be no doubt, and it is certain that this may be produced not only in the intestine by pancreatic digestion but also in the tissues. It is somewhat doubtful, however, whether it is produced by the soluble or by the organized ferments. The experiments of Hoppe-Seyler<sup>2</sup> show that the products of the decomposition of albumen, when the presence of all lower organisms is carefully excluded, are almost precisely the same as the products of the putrefaction of albumen, although no special tests were made for indol in his experiments; and Salkowski mentions<sup>3</sup> the formation of indol from fibrine when the decomposition takes place under ether, and from albumen by heating with water to a temperature of 180° C., in neither of which conditions could the organized ferments exist.

E. Baumann<sup>4</sup> considers that the indican exists in the urine in the form of a sulpho-acid, of which there are two others besides the one which by decomposition gives rise to indican, namely, one giving phenol (carbolic acid) and the other brenzcatechin. These acids are always combined with a metal. They are stronger acids than acetic acid, and their salts, therefore, are not decomposed by it, but they are readily decomposed by hydrochloric acid. The amount of these acids may readily be determined by first acidulating the fresh urine with acetic acid and adding an excess of baric chloride, which will precipitate all of the sulphuric acid existing in the urine as a sulphate; filter, and to the filtrate add an equal volume of hydrochloric acid, and warm several hours on a water bath; this will decompose the sulpho-acids, and the sulphuric acid formed by the decomposition will be precipitated as baric sulphate.

The urine of patients being treated with carbolic acid was found to contain ten or fifteen times the amount of sulphophenolic acid (also called phenylsulphuric acid) existing in normal urine. Thus, from one hundred cub. cent. of the urine of one patient there was obtained 0.355

<sup>1</sup> *Berichte der deutschen chemischen Gesellschaft*, ix., No. 2, s. 138.

<sup>2</sup> *Medicinisch-chemische Untersuchungen*. Heft iv., s. 561.

<sup>3</sup> *Berichte der deutschen chemischen Gesellschaft*, ix., No. 5, s. 408.

<sup>4</sup> *Berichte der deutschen chemischen Gesellschaft*, ix., No. 1, s. 54.

gram. of baric sulphate derived from the sulphates, and 0.266 gram. derived from the decomposition of the sulpho-acids. The urine of a dog before being treated with carbolic acid gave in fifty cub. cent. 0.318 gram. of baric sulphate from the sulphates, and 0.015 gram. from the sulpho-acids; and eighteen hours after penciling a space on the back of the animal about twice the size of the palm of the hand with carbolic acid, fifty cub. cent. of the urine gave 0.006 gram. of baric sulphate from the sulphates, and 0.225 gram. from the sulpho-acids, derived, of course, in this case chiefly from the sulphophenolic acid. The potassium salt of sulphophenolic acid was obtained perfectly pure from horses' urine, in which it exists in large amount.

In some pathological cases E. Salkowski<sup>1</sup> has found this sulphophenolic acid in very large amount in human urine, and he has always found it associated with a great increase of indican. In a case of peritonitis, where there were also symptoms of intestinal obstruction, the carbolic acid was estimated by distilling the urine after acidulating with hydrochloric acid, and precipitating the carbolic acid in the distillate with bromine. The amount of this precipitate in two hundred cub. cent. of the urine was 0.0395 gram. In other cases in which there was a very large increase of indican the amount of the bromine precipitate in two hundred cub. cent. of urine was 0.2785, 0.0485, 0.1985, 0.226, and 0.3115 gram., or a maximum in one litre of urine of 1.5575 gram., while the amount in normal urine is, according to J. Munk,<sup>2</sup> only 0.004 gram. In some of these cases the amount of the sulpho-acids was determined and found to be largely increased.

There seems to be a very close relationship between the amount of phenol and of indican in the urine, since injection of indol into the veins of animals produced not only an increase of the indican but also of the phenol.

(To be concluded.)

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## PROCEEDINGS OF THE OBSTETRICAL SOCIETY OF BOSTON.

C. W. SWAN, M. D., SECRETARY.

APRIL 8, 1876. The president, DR. HODGDON, in the chair.

*Mammary Abscess During Pregnancy.* — DR. RICHARDSON reported the case. Mrs. W., sixteen years of age, primipara. During her pregnancy her general condition had been apparently remarkably good. No cause could be assigned for the local trouble in the breast. When about seven and a half months pregnant she began to complain of slight occasional pains in the right breast. She paid no special attention to it for a week or two, when she noticed a slight enlargement in the size of the breast as compared with the

<sup>1</sup> Berichte der deutschen chemischen Gesellschaft, ix., No. 16, s. 1595.

<sup>2</sup> Pflüger's Archiv, xii. 144.

left one. Both breasts were naturally large. On examining it one day she discovered a slight local tenderness just within the circle of the areola. The breast very gradually increased in size, the pain became more constant and more severe in character, and the tenderness over the spot alluded to very marked. About eight days before her confinement I saw her for the first time, the pain having been so severe as to prevent her from sleeping the two previous nights. On examination the breast appeared nearly a third larger than the left one, and was decidedly firm and tender to the touch. There were no signs of any inflammatory action about it. Just within the areola was a soft, bulging point, at which fluctuation could readily be detected. The glands in the axilla were enlarged and tender. A free incision was made and half a tumblerful of healthy pus was evacuated. A linseed-meal poultice was ordered. Immediate relief followed the operation. Two days later a fluctuating point was detected about two inches below the seat of the incision. A second opening was made, and a seton was introduced, connecting the two openings. The case did remarkably well, and the seton was removed six days after her confinement, which occurred the seventh day after I made the first opening.

The point of interest in the case was as to what should be the proper course to pursue as to nursing the child. In this case, as it turned out, the question as to the best method of procedure did not arise, the patient having no milk in either breast. I had made up my mind that it would be best not to attempt nursing even with the unaffected breast, lest the act of nursing should, owing to sympathy, create additional disturbance in the breast which had been the seat of the abscess.

There was nothing in the history or appearance of the abscess to indicate that it owed its origin to the pregnant condition of the patient, and the case is not reported as such, but as being interesting as regards the question of what is the proper treatment with regard to lactation in such cases.

DR. COTTING said that he had had a case of mammary abscess occurring in a primipara three months before labor. The disease went through the usual process, and the breast was entirely destroyed. After the labor the woman nursed with the other breast. She subsequently had two other children, and nursed from the single breast. The "broken breast" never gave any trouble after its first healing.

DR. MINOT reported a case of abscess of the breast in a young girl who was neither married nor pregnant. An incision gave exit to a large amount of pus. He stated that he had heard it said that mammary abscess never occurred in a breast which was not nursed from; he had had a patient however, who nursed her child on the right side only, having no nipple on the left. No applications were made to the left breast, but an abscess formed there, discharged for some weeks, and was followed by much prostration.

DR. FIFIELD added a case of abscess occurring spontaneously in the breast of an unmarried girl, eighteen years of age.

DR. LYMAN said the result, as regards the possibility of nursing, would depend upon whether the abscess was or was not intra-glandular.

DR. ABBOT reported the case of a lady who had a large abscess of the



breast resulting in a fistulous opening near the nipple, from which milk escaped for five months. The child nursed the breast without trouble.

DR. CURTIS mentioned the case of a patient who nursed from the well breast without difficulty while the other was affected. He saw no objection to nursing the diseased breast so long as the pus does not flow into the nipple.

DR. LYMAN remarked that in most cases the interlobular tissue was not affected, and cases in which the whole gland is affected are comparatively rare. Where a small portion only of the gland proper was affected the relief of the remaining milk ducts might be advisable to prevent extension of the disease, but if the whole or a large part of the gland was involved the pain would prevent the application of the child to the breast. If the abscess be sub-cutaneous or sub-mammary only, he thought that in the majority of cases the continuance of nursing was not only favorable but desirable.

DR. SINCLAIR remarked that a woman has two breasts, apparently that, in case of accident, one may take the place of the other. The importance of duplication is manifest in the case of the eyes and ears.

DR. CHADWICK said he had known of a woman, in Vienna, who had milk enough for seven children on the day after delivery.

DR. LYMAN questioned whether the case reported by Dr. Richardson was more than simple abscess, such as might occur on any part of the body and independently of the pregnant state.

*On the Action of Ergot as concerns the Uterus and Bladder.* — DR. FIFIELD said that some months ago he attended a woman in confinement. The labor was excessively slow. A full drachm of ergot was given without any effect either upon the force or the frequency of the pains. Upon a later examination a fold of the bladder was found lying in front of the presenting head, and about an hour and a half after the administration of the ergot the catheter was passed. A small amount only of urine was drawn, but from that moment the action of the ergot was fully developed; the pains were revived, and the labor was speedily and safely accomplished.

Dr. Fifield recalled the observations, in Garnier's *Dictionnaire Annuel* 1873, of a physician who says when in cases of labor ergot is administered and fails to show its action on the uterus that the action is diverted to the neck of the bladder, causing spasmodic contraction. By the use of the catheter the action is transferred again to the uterus. The reviewer of this gentleman's statement criticises it by saying that it is pure assumption. Dr. Fifield said he had no other cases to cite, but it seemed well to bear the matter in mind and take advantage of the statement.

Dr. Fifield remarked that at a meeting of the Boston Society for Medical Improvement, at which he reported the case, the weight of opinion was that the action of ergot is and can be shown upon the bladder. Hence its employment in incontinence belonging to the sphincter. Dr. Wernich, on the contrary, contends that the effect of ergot is an increase of the urine itself, this being due to the augmentation of the sanguine pressure produced by the ergotine. Thus it is repletion of the bladder which causes delay in the expulsion of the fœtus after administration of the drug. He shows that in animals poisoned by ergot the bladder fills very rapidly after catheterism. Hence the rule in cases of labor where ergot is given to use the catheter frequently.

*Graily Hewitt's Cradle Pessary.* — DR. MINOT reported the cases of two hospital patients with anteversion, to whom this instrument had been of service. In one of the cases the regular manufactured article was first employed, but it was found that one made by bending into the required shape a copper ring covered with pure rubber answered better. It keeps in place nicely. A patient once sent to him by Dr. Nichols was unable to walk until after the application of one of these instruments, when she could do so with ease.

DR. FIFIELD said that there may be the most marked anteversion and yet no difficulty in locomotion, and the same may be said of retroversion. He had lately had a patient brought to him who had been under the care of various physicians for ulceration of the os uteri, and found such marked anteversion that the bladder was unable to contract as it should, but the patient had never had a symptom of trouble with locomotion.

DR. ABBOT remarked that uterine distortion often exists without the patient being aware of any trouble. He mentioned a case of complete retroflexion in a patient who ten years previously had miscarried and had never been pregnant since. Most of the time she had suffered no inconvenience from the retroflexion. A condition of congestion made her a subject for treatment, and then the flexure was for the first time discovered. She recovered from the congestion, but the distortion remained, giving her no serious inconvenience. No pessaries or supporters were employed in this case; the treatment was mainly by cold hip-baths. Other cases had come under his observation which had evidently come to the knowledge of the patient by accident as it were, the flexure continuing to some extent without much inconvenience after other local causes of discomfort had subsided.

DR. CURTIS reported the case of a girl eighteen years of age, single, who suffered great annoyance from irritable bladder. A stem pessary was applied and worn with the greatest comfort and relief.

*Cancer of the Cervix.* — DR. CURTIS reported two cases. In the first, a round-celled sarcoma, the cavity of the cervix was hollowed out like a crater. The second case was one of cauliflower excrescence. Both were greatly relieved by scraping with the spoon-shaped instrument of Simon.

*A Knot in the Umbilical Cord.* — DR. CHADWICK exhibited a cord with a knot in it, from a healthy child born at full term.

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### FERRIER'S FUNCTIONS OF THE BRAIN.<sup>1</sup>

THE turbid chaos of facts in which the laws of the functions of the encephalon have so long lain dissolved seems at last to be clearing itself up by depositing something like an orderly precipitate of doctrine. Dr. Ferrier's work may be regarded as the first successful attempt to collect and exhibit this doctrine in its full generality, — in other words we may regard it as marking the end of an old era, and the beginning of a new one in cerebral physiology. Dry as it is in point of style, we can warrant the reader who is in the slightest

<sup>1</sup> *The Functions of the Brain.* By DAVID FERRIER, M. D., F. R. S., With Numerous Illustrations. New York: G. P. Putnam's Sons. 1876.

degree interested in the subject, that it will hold him spell-bound until the last page is finished; for the facts and reasonings form such a beautifully graduated *crescendo* of demonstrative evidence, and anatomy, pathology, experiment, and psychological analysis play so harmoniously into each other's hands, that one cannot bear to interrupt the process till its logical evolution is complete.

Concerning Dr. Ferrier's originality in the matter, it may be said that in the main the conclusions of his work have for several years past been, so to speak, in the atmosphere, and that they would inevitably have soon shot together and crystallized in some one else's hands, if not in his own. Meynert's views in particular may in the main be called anticipations of our author's. But the merit of being the first authoritative propounder of a general theory of brain action based on thorough experimental as distinguished from anatomical evidence belongs undoubtedly now to Ferrier; and his own persevering investigations on the brains of monkeys have certainly helped him to this position of priority, since they alone have so beautifully (we cannot say unexpectedly) filled up the gap between the facts of human pathology, and the results of experiment on dogs, cats, and rabbits.

The actions of these latter creatures are seen clearly now to differ widely from those of man and monkey in requiring less and less of the intelligent initiative of the cerebrum for their production. A rabbit, with all his brain above the corpora quadrigemina gone, will still perform a certain number of normal motor functions, in response to sensory irritations. He will keep his equilibrium and leap forward until stopped by an obstacle, and will seem, in fact, not vastly different from a frog under similar circumstances. A dog, to show the same actions, will need to preserve at least corpora striata and thalami in addition; whilst in monkeys and in man even these ganglia perform no coördinated motions unless large parts of the hemispheres are also left functionally intact. We will state as briefly as we can the general conclusions drawn by our author from these and from other facts.

The hemispheres contain strictly localized cortical centres for the performance of particular movements and for the storage of sensible images. Dr. Ferrier has determined the latter not only in monkeys but in other animals. The auditory images reside in monkeys in the convolution which forms the posterior boundary of the Sylvian fissure, homologous with the first temporo-sphenoidal in man. This gives experimental corroboration to the theory of Wernicke based on a psychological analysis of the phenomena of aphasia. The optic images have their seat in the gyrus homologous to the combined supra-marginal and angular of man. The hippocampal convolution is the substratum of ideas of touch. *Smell and taste* are bound up with the integrity of the temporo-sphenoidal in its lower part. Destruction of the severally named parts of the hemisphere in monkeys caused abolition of the corresponding forms of sensibility. Destruction of the occipital lobes differed from other localized destructions in producing anorexia, whence Dr. Ferrier is disposed to count them as seats of organic sensibility in general, inasmuch as hunger is one of its forms. As regards the antero-frontal lobes, neither removal nor irritation causes any positive motor or sensory symptoms, but produces a change in the demeanor of the animal which the author characterizes as a loss

of the power of attention. He accordingly hypothetically suggests that these lobes may be general centres for inhibition, as attention is, according to him, conditioned upon that faculty.

Now these cortical centres coöperating together, support the entire intelligent and voluntary life of the animal. All acts implying choice, intention, or comparison, all those preceded by ideas and guided by feelings, originate here. But once originated, they may by force of habit come to be performed with less and less consciousness. In physiological terms, this means that they have become organized in the basal ganglia. The corpus striatum has become so *educated*, as to execute at a stroke a complex action which at first proceeded by distinct conscious installments, and the optic thalamus has grown in like manner able to discharge at once into the corpus striatum a complex set of sensory data, which originally needed to be deliberately felt and recognized by the superior centres in the gyri. These ganglia thus appear to be "organs of relief" for the hemispheres, and their "secondarily reflex" action is considered by Dr. Ferrier not to be accompanied by consciousness. The degree of their autonomy, however, differs widely in different animals. In birds, rabbits, etc., in whom education adds little to the powers of movement existing at birth, these centres are largely automatic from the start. Destruction of the whole cortex still leaves the animal capable of performing most of his usual movements. Indeed, in these creatures locomotion and equilibrium devolve upon the corpora quadragemina and the centres back of it, for a rabbit will stand and respond to pinching by coördinated movements of flight when his basal ganglia are both gone. His *fore* legs, however, are considerably disabled by the operation; for the movements they perform are largely influenced by distinct volition in the normal state of things, and this whole component drops out when the corpus striatum is destroyed. In the dog, automatic action as regards station and locomotion does not reside back of the basal ganglia.

After ablation of these ganglia the dog lies helpless and prostrate. But if they are left, large parts of the cortex may be removed with no permanent disorder except a sort of ataxia. The muscles move in an appropriate and co-ordinated way; *except* (and this is beautifully shown by Goltz's observations lately reported in this journal) when required to execute movements of a distinctly artificial sort. Goltz found that his trained dogs would not "give their paws" when the cortex was scooped out, though the same paw would coöperate harmoniously in the locomotive movements of the quadruped. Giving the paw required too much conscious intelligence to have become automatic in the ganglia. Now in monkeys and in man it would seem that conscious purpose plays so fundamental a part in all the motions that *none* of them ever become thoroughly automatic. Destructions of those regions of the cortex which the dog rapidly recovers from, are in monkeys followed by a complete paralysis of the appertaining limbs, and this lasts as many days as the monkey lives. Their corpus striatum may coöperate with the cortex, but cannot fully replace it. Man and monkeys in other words have hardly any native powers, and remain creatures of training all through life; whilst the results of training form but a slight portion of the aptitudes of lower creatures, and the organ of training, namely the convolutions, is, relatively speaking, an unessential part of their organization.

Dr. Ferrier agrees with those who ascribe to the thalami a purely sensory significance. Discrepant observations are beautifully explained by him. Total destruction of the thalamus abolishes all sensation on the opposite side. In this state of hemi-anæsthesia, the monkey, wholly unaware of its limbs, lets them hang flaccid, and so appears paralyzed. But the apparently paralyzed limbs will coöperate with the others when the animal is thrown on his back and struggles to recover itself. Movements of *equilibration* are in fact of a lower order than any other of the animal life, and these struggles are probably discharged from the monkey's mesencephalon. In the rabbit, however, movements of *locomotion* may occur when the thalamus is destroyed and the rabbit is pinched, but this is merely due to the fact that in this simple-minded creature, parts back of the thalami respond in this elaborate reflex way to the particular irritation of pinching. It is not due, as Nothnagel says it is, to the survival of true sensation, for burning, etc., of the opposite side calls forth no motor reaction at all in a rabbit whose corpus striatum is destroyed.

Thus, keeping account of the grading of animals above one another, the facts are seen gradually to fit together and to form an harmonious whole. We wish our space admitted of extracts, for in addition to the points we have noticed, the book abounds in original suggestions. The analysis of aphasia is admirable. Dr. Ferrier also has an important and original discussion of the motor feelings, and decides in opposition to Bain and others, that they are not feelings of the outgoing innervation, varying in specific quality as its direction to different muscles varies; but that they are ideal or actual afferent impressions, the result of the changes to which the muscular contraction when performed gives rise. His theory of attention as based on inhibition is also highly interesting and important. Both these theories, as well as his assumption that all events back of the cortex are strictly unaccompanied by consciousness, suggest doubts and further questions, which, however, we cannot enter into here. Suffice it to say that every student of the nervous system must read the entire book in which they are presented. We for our part feel a certain ethnic *amour propre* gratified by the thought that it is written not in German, but in our own tongue.

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#### A RETROSPECT.

We would call the attention of our readers to the fact that the present year concludes the first half century of the existence of this journal. Fifty years ago not a single American medical journal of the present day was in existence. We were not without a medical literature, however, for in Boston alone there existed at that time two journals, — a quarterly and a weekly. The former of these had already become what to-day would be considered a veteran journal. The *New England Journal of Medicine and Surgery*, "conducted by a number of physicians," first appeared in 1812, and was maintained at a high standard for sixteen years. We find in the leading number the names of John Warren, James Jackson, Walter Channing, John C. Warren, Jacob Bigelow, and many others, — ample proof of the excellent auspices under which our parent, if we may use the term, began its existence. The *Journal* was supported

with zeal and ability, and contained many valuable papers, but as its supporters became more engrossed in the increasing medical business, it became more difficult to prepare elaborate articles. The need of a periodical of lighter character and more frequent publication was felt.

In 1823 Dr. J. V. C. Smith started *The Medical Intelligencer*, and after a time was succeeded in its management by Dr. Coffin. This was the first and for many years the only medical weekly in the country.

It was at this period that medical journalism received a new impetus from the appearance of the *Lancet*, conducted by Mr. Wakeley, the brilliancy and satire of whose articles established that journal on a basis more enduring and prosperous than any other periodical.

In the year 1827 Dr. Walter Channing and Dr. John Ware became the sole editors of the quarterly, and it was proposed to them by Dr. John C. Warren to join with him in purchasing the *Intelligencer*, and unite the two journals, whose combined circulation would equal that of any periodical in the country. Thus originated the present Journal, the first number of which appeared on February 19, 1828, a few months after the first issue of our esteemed contemporary, *The American Journal of the Medical Sciences*. Dr. Warren contributed the leading article, giving, it may be worth while to mention, a case of trephining of the lower jaw for excision of the nerve. A woodcut of the Massachusetts General Hospital precedes the article, and adorns many of the early numbers of the Journal, for it was from this source chiefly that a large amount of the clinical material for the Journal was obtained. There are few medical centres of the world which can claim the uninterrupted appearance of a weekly publication since the year 1823. Indeed, so varying have been the fortunes of medical journalism in this country, that the more prominent journals of to-day are in point of years but infants as compared with the two which we have mentioned. Space would not permit us, and it would be no slight task to enumerate the host of contemporaries which have sprung into existence and passed away during this period. The ephemeral character of our medical literature has been, unfortunately, a marked feature, the result of a system which we have frequently called attention to and which we hope is soon to pass away. It is not without pride and satisfaction that we now approach our "semi-centennial." The elements which have combined to maintain us in a long and vigorous existence, are more potent now than ever, and the prospect of closing the half century with undimmed prestige and resources vastly increased is as favorable as it is gratifying.

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#### MEDICAL NOTES.

— E. Bidder reports in the *Petersburger medicinische Wochenschrift*, 1876, No. 8, a case where the umbilical cord could be distinguished through the abdominal wall. The cord could be felt near the umbilicus running diagonally over the back of the fœtus, and was slightly movable. In consequence of abnormal shortness, at most 30 cm. (11½ inches), it did not slip off and the child was born dead.



— *Virchow's Archiv*, lxvii., page 206, contains a report by F. Marchand of the disengagement and birth of a polypous uterine myoma, which was the size of a goose egg, with a pedicle 1.5 to 2.5 cm. broad ( $\frac{1}{2}$  inch to 1 inch), and which was situated on the front wall of the cervical canal. In straining at stool it was forced out of the vagina, and torn off without any appearance of suppuration at the place of rupture.

— M. Maisonneuve (*L'Union médicale*, November 28th) being called quite late one afternoon to reduce a dislocation of the shoulder, and unable to obtain assistance, seized the patient by the elbow, drew him over his own shoulder, making the patient's weight the counter-extension, and thus, manipulating the parts with his fingers, succeeded in reducing the dislocation. He has now resorted to this method three times. In one case, also, where the luxation had existed fifteen days, his success was complete.

— Bälz, in the *Archiv für Heilkunde*, xvii., page 468, speaks of a case of chronic digitalis poisoning which was observed in Wunderlich's clinic. A woman afflicted with a high degree of mitral stenosis had, through a prolonged use of large doses of digitalis, so accustomed herself to the drug that without it she fell into the most miserable condition; this was almost magically removed by the exhibition of the drug. She used daily morning and evening 0.3 grm. of digitalis (nearly gr. v.), and had in seven years taken over 800 grm. (more than 2 lbs.) of the preparation. The case described has a very great resemblance to those of morphineism.

— Albrecht, in the *Petersburger medicinische Wochenschrift*, 1876, No. 24, reports five cases of supernumerary semilunar valves of the heart, two of which were of the aortic and three of the pulmonary valves. The number of valves in each case was four, of which three were of the normal size while the fourth appeared considerably diminished. In one case only, two pulmonary valves were half as large as the two others.

— J. Steinitz, in the *Allgemeine medicinische Central-Zeitung*, in reporting about the epidemic of measles in Breslau, speaks of three children whom he saw, varying in age from three to eight years, where a recurrence of measles took place twice in two weeks and once in three weeks after complete termination of the disease.

— According to the *London Lancet*, December 2d, disinfection as a system is almost unknown in Paris and throughout France. In that country there is no law to provide for disinfection of houses or clothing, even after the most infectious diseases, nothing to prevent the healthy from occupying habitations saturated with the poison of such diseases, or from wearing the clothing recently worn by the sick. If fumigation and the like were desired by those concerned, there would be almost insuperable difficulties in the way, there not being men competent to the task, nor any establishments where bedding, clothes, carpets, etc., can be disinfected by heat. Furthermore the public are not protected against infection in public conveyances, persons suffering from such diseases often riding to hospitals in such vehicles. If this be so, it is an interesting question how much worse off are the French, so far as the spread and amount of such diseases are concerned, with this startling imprudence, as the *Lancet* calls it, than the English with all their multifarious laws in the

matter, and their frequent infractions. The subject is worthy of further study and comparison.

— In the *Deutsche medicinische Wochenschrift*, No. 16, 1876, Rutenberg gives the results of an attempt to diminish the temperature of the body by means of cold water enemata after the method of Simon and Heger. Rutenberg injected cold water high up into the intestine and let it remain till it was thought to have been warmed to the temperature of the body, when it was allowed to escape. He observed on himself after the injection of  $\frac{4}{5}$  to  $\frac{7}{8}$  litres (nearly 2.638 to 3.69 pints) of water at  $0^{\circ}$  C. ( $32^{\circ}$  Fahr.), or a little warmer, that the temperature in the mouth at the same time fell  $1.1^{\circ}$  to  $1.5^{\circ}$  C. ( $1.98^{\circ}$  to  $2.70^{\circ}$  Fahr.), and a quarter to a half hour later rose again. In two out of three experiments in which the thermometer was read off every five minutes a very slight elevation preceded the fall ( $0.05^{\circ}$  C. =  $0.9^{\circ}$  Fahr.). In two young people who suffered from intermittent fever he made injections during the hot stage. By this means the temperature in the axilla in one fell during two hours and a half from  $41.1^{\circ}$  to  $40.2^{\circ}$  C. ( $105.98^{\circ}$  to  $104.36^{\circ}$  Fahr.), in the other during two hours and two thirds from  $39.7^{\circ}$  to  $38.5^{\circ}$  C. ( $103.46^{\circ}$  to  $101.3^{\circ}$  Fahr.). Rutenberg regards this fall as purely the result of the injections of water, and from it seeks to determine the amount of cooling of the body.

— A talking-machine, says *L'Union médicale*, is in Brussels, the invention of Professor Faber. He has been twenty years in perfecting it, and has at last attained success. The machine has three essential parts: the lung, a bellows moved by a lever which is worked by the foot; the larynx, which consists of a single membrane; and the mouth, which is enormous, with a tongue of proportional size. The person who makes the machine talk plays with his fingers on fourteen levers, each one of which is marked with a letter. By combination of these levers two by two the remaining twelve letters are produced.

A practical use of this machine is to teach deaf mutes to speak. They see the movements which its tongue makes to produce the various sounds, and strive to imitate these movements, which, owing to the size of the organ, they can easily observe. Talking-machines are not new; those who frequent medical societies are familiar with them, but we are glad to find that there is one worthy of imitation. In most cases we would wish the machine to imitate the deaf mute.

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## MASSACHUSETTS GENERAL HOSPITAL.

### MEDICAL CASES OF DR. MINOT.

*Ulceration of the Os Uteri resembling Malignant Disease; Cure.* — Harriet P., thirty years old, married, entered the hospital February 8, 1876. She had always been delicate. Married ten years ago, she had a miscarriage a year afterwards, at the third month, which was followed by hæmorrhage lasting several weeks, owing to retained placenta. A year later she was confined at full time, after a hard labor, which seems to have left her with a separation of the symphysis pubis, preventing her from walking for three months. From this she recovered, but for four or five years past she has had cough,

and occasional hæmoptysis for two or three years, — but she has not been ill until June, 1875, when she began to flow, between the monthly periods, and to be much troubled with leucorrhœa, pain in the left inguinal region, left thigh, and back, and a sensation of bearing-down. There was, also, prostration, with inability to walk.

These symptoms continued at the time of her entrance. She was pale, but had no fever, nor any cachectic appearance. The cervix uteri was voluminous and hard, pointing downwards and forwards. The os was surrounded by a margin of grayish-red, abraded or ulcerated surface, half an inch wide. It was rough, tender, and bled very freely when touched. The disease extended upward on the outside of the cervix, towards the left, and posteriorly, nearly as high as the vagina. There was some retroversion of the uterus, the sound being directed backward, somewhat downward, and to the left (the patient lying on the left side). It entered to the length of three inches. No enlarged glands could be felt in the vicinity of the uterus.

The appearances resembled those of epithelial malignant disease, and the question of removal of the cervix by the knife or wire cautery was considered, but the operation was deferred in the hope that treatment might be followed by improvement.

At first, chromic acid (a saturated solution) was applied freely to the diseased surface. This was repeated at intervals of about a week. No improvement followed, the hæmorrhage, pain, bearing down, etc., continuing exactly as before. There was no extension of the disease, but no change for the better could be seen. Several superficial ulcerations covered with sloughs were noticed on the anterior and lateral aspects of the cervix, probably caused by the acid.

May 14th, a saturated solution of carbolic acid with an equal amount of glycerine was substituted for the chromic acid, and this treatment was continued, at intervals of a few days, till June 1st. There was no improvement, however, though still no extension of the disease. The nitrate of silver was now tried, the diseased surface being lightly touched with the solid stick. On examination, four days afterwards, a decided change for the better was noticed. The application was repeated on the 7th, and again on the 11th, when it was recorded that "the abraded surfaces are gradually healing." Four more applications were made, at intervals of about five days, and on the 29th the surface was completely healed. The patient left the hospital well, on the 30th. Treatment always was followed by the application to the cervix of a pledget of cotton soaked in glycerine. Injections of warm water were occasionally used, and also warm hip-baths. Tonics and a good diet were prescribed.

*Uterine Fibroid, treated with Ergot.* — Mary B., aged forty-three years, entered the hospital, May 13, 1867. She is married and has had two children and one miscarriage. Last pregnancy more than fifteen years ago. The menses were always regular, appearing every three weeks, and were quite profuse. Five years ago she noticed a hard, smooth, round tumor in the right inguinal region. It was movable but not painful nor tender. At the same time there was frequent micturition, also constipation, a bloody discharge from

the womb, and pain in the back. These symptoms continued up to the time of her entrance.

A large, hard irregular tumor occupied the region of the abdomen below the anterior superior spine of the ilium, to the right of the median line. An outgrowth from this, globular in shape, extended towards the left, and upwards for about three and one half inches above the ramus of the pubes. The tumor was movable, and examination per vaginam with the finger and by the sound showed that it formed a part of the womb. The sound entered to the extent of four and one half inches, in direction backward and to the right. There was profuse menorrhagia, and the woman was pale and waxy-looking.

She was ordered twenty drops of the fluid extract of ergot; on the 15th the dose was increased to forty drops. This caused a good deal of pain, extending from the right flank down the thigh, and the patient complained so much that the medicine was omitted on the 21st, for twenty-four hours. The pain was somewhat diminished, but returned again with the resumption of the ergot on the 22d. The uterine discharge became more yellow and thicker. No particular change was noticed on external or internal examination. On the 29th the ergot was again omitted for a day, with relief to pain. The dose was then increased, first to fifty drops, then to one fluid drachm, and afterwards to a drachm and a half three times daily. On June 3d it was noted that the tumor seemed decidedly softer.

The treatment was continued till July 11th, when it was omitted, probably on account of the pain. (The service came under the charge of another physician, July 1st.) The patient left the hospital, July 20th, considerably relieved in respect to the hæmorrhage, but without any decided diminution in the size of the tumor.

*Acute General Tuberculosis; Death in Seven Weeks.*—James Brady, thirty-four years old, single, born in Ireland, entered the hospital March 15, 1876, with the following history. His parents and other relatives were all healthy, so far as he knew. He had never been sick before the present attack. He had been in the habit of taking liquor to excess, at times, but he averred that he had not drunk a drop for the past six months. He had been much exposed to wet and cold. Six weeks before entrance, after exposure, he was taken down with chills, headache, thirst, cough, and expectoration of "rusty" colored sputa. He had no pain in the chest, and no hæmoptysis. There was little or no dyspnoea. He lost flesh and strength rapidly. He slept poorly; and lost his appetite; bowels regular.

There was very little difference on percussion between the two sides in front; abundant, moist, clicking râles, increased by cough, in right upper front, and throughout the right back; in right lateral region the respiration was harsh. The chest-wall below the right clavicle was considerably sunken. On the left side the respiration was harsh and jerking, but no râles were heard.

There was a good deal of emaciation. For several days the temperature remained at 100° in the morning, rising one or two degrees at night; pulse 108; respiration 34. He sank rapidly, and died, March 24th, the physical signs increasing daily.

*Autopsy*, by Dr. FITZ. The right pleural cavity was obliterated by old ad-

hesions. Left upper lobe adherent to a limited extent; the pleural surface of the left lung was dotted with miliary tubercles. Both lungs, especially the left, were dotted with yellow granules, of the size of a pin's head, or less, apparently the cheesy contents of small bronchi; elsewhere, especially at the bases of the lungs, were innumerable gray, glistening granules. Numerous dilated bronchi communicated with occasional cavities, the largest of which were of the size of English walnuts, in the upper lobe of the left lung, and there were small isolated patches of cheesy degeneration. The spleen was enlarged, and its surface minutely granulated from the presence of innumerable gray, miliary tubercles. The kidneys on section showed many rather opaque tubercles, both singly and in groups of three or four. The liver contained numerous opaque, miliary tubercles. There were many ulcers in the small intestine, from the middle downwards, and a few cheesy follicles in their vicinity, but no tubercles. The pia mater on the under surface of the anterior lobes of the brain was rough, but no tubercles were observed.

*Wasting Palsy.*—John V., sixteen years old, entered the hospital, April 20th, and was discharged "relieved," August 29th. His family history was good, and his parents were in comfortable circumstances. When very young, he had a "fever" which laid him up a long time; he also was afflicted with a "scrofulous humor" of the head. For some years he has been subject to "bilious attacks," with nausea, vomiting, headache, etc., lasting several weeks. Six years ago, without known cause, a dull, heavy pain, with weakness, gradually came on in the right arm and left leg, no other part being affected. These symptoms have continued up to the present time. He never had rheumatism.

Dr. J. J. Putnam, who kindly examined the patient, made a report of his condition, from which the following particulars are taken. All the muscles of the right hand and arm are smaller and softer than those of the left, and the patient considers that arm as decidedly the weaker of the two (he is not left-handed). There is no prominent atrophy anywhere, except on the flexor side of the forearm. All movements are possible. The lower angle of right scapula is more prominent than that of left, but the right serratus magnus contracts readily under faradization. The metacarpo-phalangeal angle of the thumb is more prominent than normal, and the plane in which the thumb lies, approaches abnormally that of the rest of the hand. The patient can grasp almost as firmly with the right hand as with the left. When the hand is resting on the knee the fingers twitch slightly, from time to time. At the entrance of the patient, fibrillary twitching was also observed in the larger muscles of the shoulder and arm, but after he had been in the hospital for some weeks, (under daily treatment with galvanism and faradization,) this was no longer to be observed. The patient afterwards made a stay of two weeks at home, and on his return the fibrillary twitching was again observed, and again disappeared after treatment, that of the fingers, however, still persisting. All the muscles of the left thigh and leg are uniformly smaller than those of the right side, but all respond readily to faradization, and to the will. All the nerve-trunks of the right arm apparently respond as readily to faradization as those of the left, but the contraction of the flexor sublimis digitalis, and of the

flexor brevis and opponens pollicis is very feeble, so that it is difficult to produce the result which normally attends their action by exciting the median nerve in the upper arm. They all contract sufficiently readily, however, under careful localized stimulation.

The treatment employed was mainly galvanism direct and induced, with the administration of cod-liver oil and iron, good diet, and moderate exercise out of doors. The patient and his friends felt sure that he had gained in strength, during his stay of over four months in the hospital, and the wasting of the flexor muscles of the forearm and of the flexors of the hand was less marked than at first.

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#### LETTER FROM PHILADELPHIA.

MESSRS. EDITORS, — Dr. H. C. Wood, recently elected professor of *materia medica* in the medical department of the University of Pennsylvania, was so fortunate as to obtain from Professor Soldanha of the Brazilian Commission at the late Exhibition a collection composed of roots, herbs, many kinds of seeds, specimens of various kinds of India rubber, and several kinds of tapioca which the South American people bake in the form of loaves; also a specimen of turtle butter, a mild fatty substance which retains its sweetness even after six months' exposure. This substance is used by the inhabitants of Brazil as we use the ordinary butter. In this collection there are, too, three or four kinds of jaborandi; and, by the by, what we call jaborandi, Soldanha says, is another thing entirely, and is called in Brazil by a Spanish name which signifies "cure for serpent bite." It belongs to the genus *Rutaceæ*. True jaborandi belongs to the family of the *Piperaceæ*. *Mattæ*, or South American tea, in regard to which a pamphlet has been published, is another interesting specimen in this instructive collection. In view of the slight intrinsic value of these specimens one would think that the centennial custom-house authorities could offer no objection to their removal, and so thought Dr. Wood. But he had seen only one side of the shield. The wisecracks of the revenue service soon entertained him with an act from *Much Ado About Nothing*. The little collection which was to be used merely for teaching had to be invoiced, entered, and passed like a bale of silk. This was, of course, an instance of red tape which might put Mark Twain's "beef contract" to shame. But Wood is nothing if not persistent. The collection was to be passed free of duty; nevertheless a broker had to be engaged, and all the other enjoyable details properly cut and dried. I don't know how many hours this labor cost Wood, but after much travail the delivery was effected and he has his collection.

The members of the late Centennial Medical Bureau were recently honored by the gift to each of a handsomely bound copy of the Catalogue of the British Section, "with the compliments of His Grace the Duke of Richmond and Gordon." The British Commission had been much interested in the Medical Bureau, and took this pleasant and courteous means of expressing their appreciation of this feature of the Exhibition.

The insane department of the Philadelphia Hospital now contains 1169 inmates. Including the new pavilions there are accommodations for 766 pa-



tients. Consequently this department is terribly crowded. Patients are so huddled together that classification is impossible. The result is that even mild cases become incurable, and under existing circumstances cure is out of the question. Everything is in perfect order, patients are clean and warmly clad, but the effects of overcrowding are painfully apparent. There is a Babel of confused sounds. Owing to the overcrowding not even the skill of Dr. Richardson, the resident physician, is able to dissipate the vagaries of the mildest lunatic. The Board of State Charities has for years fought for the better accommodation of these unfortunates. Ten gentlemen have finally been appointed with powers to select a site for a new institution, for which twenty-five thousand dollars have been appropriated. Appropriations for the building are yet to be made. It is hoped that the hospital will be located in Philadelphia. The project originated with George L. Harrison, formerly president of the Board of State Charities.

I think you will be interested in a brief allusion to our art school. Since the opening of the schools in October the directors of the Academy of Fine Arts have been making energetic efforts to extend the educational advantages of the institution. Their wish is to render the course of study comprehensive and thorough. In addition to the life and antique classes there have recently been organized a drapery-painting class and a class in modeling. The importance of the latter is shown by the fact that it is largely made up of the members of the drawing and painting classes, who see how necessary it is that they, as well as those who mean to devote themselves to sculpture, should work from the living model. Hitherto there have been no proper facilities in this city for working in clay from the living model, but it may now be doubted whether any Continental school has as fine a modeling room as that which has been arranged at the new Academy of Fine Arts. It is as noble as the building itself, and is provided with all the conveniences which art students could demand. The modeling class is taught by the distinguished sculptor, J. A. Bailly. To the list of professors have recently been added the names of Christian Schüssle, Thomas Eakins, and Dr. W. W. Keen. The latter gentleman holds the chair of artistic anatomy, a branch which he is peculiarly well fitted to teach. This is, besides, one of the new professorships of the school. Nothing, indeed, has been omitted in the endeavor to make the institution thoroughly attractive to art students, and it may be safely said that the faculty of the Pennsylvania Academy of Fine Arts is a very strong body of teachers.

In one of our quiet by-streets is an institution designed for the treatment of diseases peculiar to women. It is a special hospital, and its object is separate and distinct from that of any other hospital in the city. This does not seem to be generally understood, since it is frequently confounded with the Woman's Hospital, in which women are treated for any non-contagious disease without regard to its nature, while at this institution — the Gynæcological Hospital — but one class of patients is received, namely, poor and reputable women who are afflicted with diseases of the womb or its appendages. The aim of the corporators of this hospital is to meet the wants of thousands of impoverished but respectable women who suffer from the diseases referred to, and who,

rather than seek relief at a general hospital, will doom themselves to lives of pain and perhaps of uselessness. The Gynecological Hospital offers them not only freedom from observation while under treatment, but supplies them with many necessary conveniences otherwise beyond their reach. This is only one of the many practical charities which are so abundant and so generously supported in Philadelphia. The hospital is in the third year of its life, and bids fair to become an efficient and enduring aid to suffering women.

The city council recently called upon the health officer of the Philadelphia Board of Health for an estimate of expenses for 1876. In the course of his response Mr. Addicks makes the following allusion to the health of the city during the present year: "In view of the enormous floating population of centennial visitors and of the long and excessive hot term during the summer months, the general health of Philadelphia has been almost all that could be desired. Two diseases have been more prevalent than heretofore, and have demanded the utmost care and vigilance of the Board of Health in order to check their course and abate their cause, namely, typhoid fever, of which the number of deaths up to this date is 634, representing a supposed number of 3804 cases; and small-pox and varioloid, 357 deaths, representing a supposed number of 2142 cases. The deaths from the same diseases during the year 1875 were typhoid 419, small-pox 54. The utmost care should be taken against the increase of the latter disease during the approach of winter, and I may now say that in a certain section of our city prompt and thorough action must be taken by this department in this direction."

To what section of the city Mr. Addicks thus refers I do not know, but I know of one in which a physician two months ago treated a youth for small-pox. Upon his recovery the mother of the patient hung his bedding and clothing in her yard, where they remained several days. Shortly after she, too, was stricken down. The same physician attended her. She died, and her body remained in the house forty-eight hours. A father who lived in the same house, an ignorant man, but one who possessed common sense, called upon his physician for advice. He feared that his family might become victims to the contagion to which they were so criminally exposed. Proper advice was given him. He first threatened the physician who had attended the small-pox cases, and finally did report him and the cases to the Board of Health. The physician attempted to browbeat him, and the Board of Health could do but little because the woman was already dead and about to be buried. The attending physician *had reported neither case to the Board of Health*, and in all probability would have gone quietly on with a score of other cases, if need had been, in the same house. He is an intelligent man. Is comment necessary?

The board of managers of the University Hospital recently submitted their report (at their third annual meeting) for 1876. The number of patients in hospital January 1, 1875, was 34; number since received, 609. The number at present in hospital is 57. Average residence of patients 29.05 days; percentage of deaths, 7.3. The cost of maintaining each patient was \$1.38½ per diem. Total cost of maintaining the hospital for the year, \$26,179.65. Receipts for the year, \$1845; from the board of patients, \$11,409.24. Number of patients treated in the surgical dispensary from January 1, 1876, 1099; in

the medical dispensary, 2126; ear dispensary, 186; dispensary for nervous diseases, 303; eye dispensary, 513; diseases of women, 460; skin diseases, 322; total, 5009; treated in hospital, 609; grand total, 5618.

A new professorship has just been created in the University of Pennsylvania by the influence or at the request of Mr. John Welsh. This gentleman is president of the Centennial Board of Finance, and has won heartfelt admiration and respect, not only for his eminent and untiring services during the Exhibition, but more perhaps for his energy and courage, five years ago, when he was almost alone in having a firmly-rooted faith in the success of a Centennial International Exhibition. He is the one man to whose unflagging zeal the existence and splendid triumph of the Exhibition was due. Grateful citizens wished to offer Mr. Welsh a testimonial in token of their appreciation, and he with a noble thoughtfulness begged that, while he accepted the essence of this testimony, its practical form might be tendered to the university for the foundation of a professorship, to which he would be glad to give his own name. It is called the "John Welsh Professorship," and the endowment for its establishment was \$50,000.

Since 1868 the university has been wonderfully favored by gifts of this nature, namely, the residue of the estate of John Henry Towne, \$500,000; the professorship of dynamic engineering, founded by Asa Whitney, \$50,000; gift of land by J. V. Williamson, \$75,000; gift of Reese W. Flower for the astronomical department, \$200,000; contributions to the general endowment, \$177,000; John Welsh Professorship, \$50,000; the library has received from four sources \$40,000. The hospital has received from the city of Philadelphia six acres of land, \$50,000; from the State, \$200,000; from J. V. Williamson, land, \$75,000, and numerous private gifts amounting to \$204,000; a total of \$529,000; and for the university at large a grand total of \$1,621,000. What makes these figures more impressive is the fact that this enormous amount has been donated within the past eight years. During the eighty years prior to 1868 not a dollar had been given to the university. This brilliant array of gifts which have been suddenly showered upon her tempt one to believe in the tales of the Arabian Nights. Some of the gifts have not yet been received by the university, as life estates in some of them are still outstanding, and others do not at present produce an income; but the list, as given above, is a sure indication of the interest felt in the institution by the city and State.

H. O.

PHILADELPHIA, December 25, 1876.

## COMPARATIVE MORTALITY-RATES FOR THE WEEK ENDING DECEMBER 23, 1876.

	Estimated Population, July 1, 1876.	Total Mortality for the Week.	Annual Death-Rate per 1000 for the Week.	Death-Rate for the Year 1875.
New York	1,061,244	432	21.17	29.35
Philadelphia	825,594	281	17.69	22.24
Brooklyn	506,233	185	19.00	24.92
Chicago	420,000	159	19.69	19.75
Boston	352,758	172	25.35	26.20
Providence	101,500	41	21.00	19.02
Worcester	51,087	18	18.32	20.91
Lowell	51,639	16	16.11	20.55
Cambridge	49,670	15	15.70	23.31
Fall River	50,372	10	10.32	23.99
Lawrence	36,240	10	14.35	25.96
Lynn	33,548	14	21.70	19.23
Springfield	32,000	3	4.81	20.93
Salem	26,344	20	39.40	22.92

Normal Death-Rate, 17 per 1000.

BOOKS AND PAMPHLETS RECEIVED. — What is the Nature and Purpose of the Fever Process in Human Bodies? By Z. Collins McElroy, M. D. (From the Cincinnati Medical News for December, 1876.)

The Physician's Handbook for 1877. By William Elmer, M. D., and Albert D. Elmer, M. D. New York: W. A. Townsend. A very convenient and useful handbook.

We have received from A. Williams & Co. the Physician's Visiting List for 1877, published by Lindsay and Blakiston. It is prepared in its usual neat and convenient style.

The American Journal of Microscopy and Popular Science. Pp. 16. Vol. II. No. 1. January, 1877. (From C. Stodder.)

BATTLE'S solution, of which we are requested to give the formula, is a secret remedy. It is thought to be made pretty nearly as follows: —

R $\bar{y}$  Extract opii (hard) . . . . . 3 iij.  
 Aquæ dest. bul. . . . . 3 iij.  
 Dissolve and filter. When cold add  
 Spirit. vini rect. . . . . 3 vi.  
 Aquæ q. s. to make . . . . . Oij.

The above are English imperial measures. The dose is half that of laudanum. — Eds.

At a meeting of the medical staff of the Free Hospital for Women, held December 29, 1876, the following resolution was adopted: —

Whereas God in his infinite wisdom has taken Dr. W. W. Morland from our number,  
 Resolved, That by his death we have lost a highly esteemed friend and co-worker, and the institution one of its most influential supporters.

Dr. F. Minot has been unanimously elected to fill the vacancy in the consulting board occasioned by the death of Dr. Morland.

NORFOLK DISTRICT MEDICAL SOCIETY. — The regular meeting will be held in Bradley's Building, corner of Dudley and Warren streets, Roxbury, on Tuesday, January 9th, at eleven o'clock. Papers, communications, etc.: —

1. Dr. D. D. Gilbert, Extra-Uterine Fœtation, with a Case.

2. Dr. Robert Amory, Local Boards of Health, and the Duties of the Medical Profession relating thereto.

3. Dr. James Waldo, Observations upon School Hygiene.

4. Dr. J. S. Greene, The Regulation of Temperature in Some Acute Diseases.

Lunch at 1.45 P. M.

ARTHUR H. NICHOLS, Secretary.





*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



*Fig. 6.*